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(54) Title: PERSONALIZED INDIVIDUAL SECURED CARD PRODUCTION DEVICE		
(57) Abstract <p>There is disclosed a card delivery system which includes a personalized individual continuous card production apparatus. The continuous card production system for producing a secured card for an applicant that meets the predetermined minimum criteria for receiving an approved card includes a printer/embosser (80) and a computer operably connected to the printer/embosser for operating and controlling the printer/embosser (80). The printer/embosser (80) includes a printing mechanism, an overcoater (82), an encoder (84) and an embosser (86). Preferably the card production apparatus includes a camera and an image capture system operable connected to the computer. The image capture system translates the picture from the camera into a digital format. The card production apparatus allows for the decentralization of a card delivery system, for instance it will facilitate each branch of a financial institution in becoming a location where credit cards may be produced and delivered.</p>		

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PERSONALIZED INDIVIDUAL SECURED CARD PRODUCTION DEVICE FIELD OF THE INVENTION

This invention relates to a system for producing secured cards and in particular a system and device for producing personalized individual secured cards.

BACKGROUND OF THE INVENTION

Secured plastic cards such as credit cards, debit cards, health cards and the like are well known. It is very important in the delivery of these cards that security measures are put in place to ensure that the individual who applied for and was approved for the card is the individual who receives the card.

Typically secured cards are produced on mass at a centralized location where they are produced in batches. Each card has to undergo a number of processing steps before it is delivered to a user. For example the card has to have graphics printed on each side of the card. The card has to be overcoated once the graphics are printed thereon. The name of the card holder, the card number and the validation dates all have to be embossed onto the card and then the embossed letters are tipped so that they can be easily read by an merchant or card user. Typically, in the batch method, there is a separate apparatus which performs each processing step and a large volume of cards is processed by each separate apparatus before a batch of cards is moved to the next apparatus.

The advantage of the batch system is that a large number of cards can be produced relatively inexpensively. A major disadvantage of such a system is that although it is relatively inexpensive to produce each card it is very expensive to deliver. The delivery expenses include the printing and mailing costs to deliver the card, the printing and mailing costs to deliver a personal identification number and the printing and mailing costs to deliver a letter to confirm an individual has received the card and number. These printing and mailing costs significantly increase the cost of delivering a card. As well there are the expenses with regard to cards that are lost or stolen in the mail.

Another disadvantage of a centralized batch production system is that it is slow to respond to change. For instance when the issuing institution requires a change in the art work or other information on the card, such changes are generally slow to be implemented. Further, a centralized batch production system does not include a method of including a picture of the card holder as an integral part of the card. For a centralized batch production system to be adapted to include a picture of the card holder the cost of providing the card would increase because of the security issues associated with transporting the card holder picture to the card manufacturer. In addition there would be an increase in production costs because the card could no longer be produced in batches since each card would be different.

Identification card production systems are available where an identification card is produced with a picture and other personalized information printed thereon. These cards however do not have all of the features of a credit card. Particularly these cards are not embossed. Without the embossing the card could not be used in credit card machines that uses pressure to transfer the embossed information onto a credit card slip. Therefore existing printer technology cannot produce a personalized individual credit card type card.

Accordingly it would be desirable to provide a system and device for producing a personalized individual secured card that can be located at the site of the institution that is delivering the card. This would clearly reduce the cost of delivering the card to a cardholder. Further it would be desirable to provide a system for delivering cards that could be adaptable to produce different art works, that could include a picture of the card holder and that would permit card production while the card holder waits.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an apparatus

for printing, encoding and embossing a personalized individual identification card in a continuous process.

It is an object of the present invention to provide an on site system for producing a printed, embossed and encoded personalized individual identification card at a predetermined site.

The present invention discloses a card delivery system which includes a personalized individual continuous card production apparatus. The continuous card production system includes a printer/embosser and a computer operably connected to the printer/embosser for operating and controlling the printer/embosser and producing a secured card for an applicant that meets the predetermined criteria for receiving an approved secured card. The printer/embosser includes a printer, an overcoater, an encoder and an embosser and tipper. Preferably the printer is a double sided printer and the printer and overcoater are the same mechanism. Preferably the card production device includes a camera and an image capture system operable connected to the computer. The image capture system translates the picture from the camera into a digital format. The card production device allows for the decentralization of a card delivery system, for instance it will facilitate each branch of a financial institution in becoming a location where credit cards may be produced and delivered.

In another aspect of the invention a personalized individual secured card printer/embosser for printing secured cards is disclosed. The printer/embosser is adapted to be attached to a computer for operating the printer/embosser. The printer/embosser includes a printing mechanism, an overcoater, an encoder and an embosser and tipper. Preferably the printing mechanism is a double sided printing mechanism and is capable of printing designs on two sides of the secured card. The overcoater is operably connected to the double sided printing mechanism and is for overcoating both sides of the printed card with a foil. Preferably the printing mechanism and the overcoater are the same mechanism. The encoder is operably connected to the overcoater and is for encoding predetermined information

into a memory device. The embosser and tipper are operably connected to the encoder and are for producing raised alpha numeric characters with color applied thereto on the secured card.

5 Further features of the invention will be described or will become apparent in the course of the following detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described by way of example only, with reference to the accompanying drawings, in which:

10 Figure 1 is a flow chart of a card delivery system of the present invention;

Figure 2A is a detailed flow chart of the card delivery system;

Figure 2B is the continuation of the detailed flow chart of a card delivery system of the present invention shown in Fig. 2A;

15 Figure 3 is a flow chart of the personalized individual secured card printer/embosser;

Figure 4 is a perspective view of a printer/embosser apparatus of the card delivery system of the present invention;

Figure 5 is a flow chart of the processing steps of the printer/embosser apparatus of figure 4; and

20 Figure 6 is a flow chart of the processing steps for the continuous card production system.

DETAILED DESCRIPTION OF THE INVENTION

Referring to Fig. 1, the main steps of the card delivery system of the present invention are shown generally at 10. The card delivery system includes an application step 12, a data input step 14, a data evaluation step 16 and a card production step 18. In the application step 12 the user or potential card holder provides information to the issuing institution to apply for the relevant secured card. The institution may be a bank, a credit union, a trust company, a merchant, a hospital or a

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government or any other organization which provides cards. The institution inputs the data in step 14 in accordance with their internal requirements. The institution then evaluates the data in step 16 to determine if the applicant is approved. Once the applicant has been approved the card is then produced in step 18.

Referring now to figures 2A and 2B, application step 12 is the initial stage for obtaining a personalized identification card. The institution identifies potential customers or users by way of direct mail 20, point of sale 22 or telemarketing 24. Direct mail 20 solicitation is generally conducted by way of pre-approved applications or an invitation to apply. The application at the point of sale 22 will typically be at the financial institution branch location 26 or at the merchant's 28 place of business. Telemarketing 24 is generally where card applications are received through a phone-in response line. In the application step 12 the customer provides the institution with all of the information required by the institution.

Referring to Figure 2A, data input step 14 may be performed in a number of ways. For example, there may be a central data entry site 30 where the paper based applications are inputted. These applications may be sent to data entry site 30 directly by the branch, the merchant or the applicant. Alternatively the data may be entered by way of a direct input device 32. Direct input device 32 allows the branch or merchant to input the information directly at the point of sale. Direct input device 32 would be connected to a central system where the information is processed.

The criteria for the data analysis step 16 (shown in figure 2A and 2B) is set individually by each institution. Typically the data analysis step includes an application qualification system (AQS) step 34 which uses information obtained from a Credit Bureau Data Base type service 36. The relevant information is obtainable from the Credit Bureau Data Base 36 because the appropriate information was obtained through the application 12. In the data analysis step 16 the applications are divided into three streams namely approved 38, need more information stream 40 and refused

stream 42. If the application is refused, as shown in stream 42, the applicant is notified immediately generally in the form of a letter 44 to the applicant. If more information is required, as shown in stream 40, the applicant is invited to provide this information and the information is re-
5 evaluated. If the application is subsequently approved at step 46 it rejoins the approved stream and if it is rejected 48 a letter 44 is sent to the applicant.

The final stage is then to produce the card in step 18 shown in figure 2B. The approved application 38 and 46 is logged into a system or
10 file of approved applications 50 and the applicant is notified and requested to attend at the appropriate location where a personalized individual secured card production apparatus 52 is located. The applicant is notified either by letter 54 or phone 55. When the applicant attends at the appropriate location the applicant is required to identify themselves with such
15 information as address, social insurance number and mother's maiden name. This information is cross-referenced with the approved application file 50 to verify the applicant's identity. If the applicant's identity cannot be verified the process is stopped, security is notified and appropriate actions are taken. If the applicant's identity is verified a card is produced by the personalized
20 individual secured card production apparatus 52.

Personalized individual secured card production apparatus 52 or station includes the following elements, a personal computer 70, a camera assembly 56, an image capture system 58, and a PVC (polyvinyl chloride) card printer/embosser 60. The computer 70 includes appropriate software
25 and hardware to run the image capture system 56 and the printer/embosser 60. Typically the computer would be at least a 486 personal computer however it will appreciated by those skilled in the art that any computer that is capable of handling the software and hardware could be used.

The image capture system 58 translates an image into a digital
30 format. Accordingly the image capture system 58 may include image data base application software, image server software, an image capture board

and a VGA (video graphics array) card all of which are compatible with computer 70 and installed therein. In use the camera assembly 56 is either operably connected to the image capture system 58 so that the image is electronically transferred directly to the computer without producing a conventional photograph or the camera can produce a conventional photograph which is scanned and the scanned image is transferred to computer 70. Camera assembly 56 and image capture system 58 may also be housed in one camera/computer type assembly that can serve both functions. An example of such an integrated system is the CAMPUTER™ using proprietary software both made by ABANDARA™.

The applicant's image will be stored preferably digitally in an image file 72 and in a card master file 74 for future reference and for security and filing purposes. The information stored in image file 72 and master file 74, including a picture of the applicant, will improve the security measures that the institution is able to implement.

Preferably printer/embosser 60, the features of which are described in figure 3, includes a high quality multi-color printer which prints the customer's photograph and a detailed high quality card design. The printer/embosser includes a double sided printing mechanism 62 and can print an image on both sides of the card. The card design is printed right to the four edges of the PVC card in a technique known as bleeding. Typically the printer uses yellow, magenta, cyan and black thermal transfer foil with an overcoating process to overprint multi-color pictures. The printer/embosser also includes an overcoater 64. The overcoating process overcoats the both sides of the card with an overcoating foil which can be a high transparent or a hologram foil in endless or diffraction marks. The printing mechanism 62 and overcoater 64 may be the same module where the mechanism overcoats the card after the printing step is completed. Alternatively a separate overcoating mechanism can perform the overcoating function. Printer/embosser 60 includes an encoder 66. Encoder 66 may be a magnetic stripe encoder which is capable of encoding the magnetic stripe

on the card according to prescribed specifications and standards. In addition or alternatively encoder 66 includes a chip encoder which is capable of encoding or programming the chip according to prescribed specifications and standards. Printer/embosser 60 also includes an embosser and tipper 68 which embosses and tips alpha numeric characters onto the card. Typically these characters include the name of card holder, card number and validation dates. It will be appreciated by those skilled in the art that printer/embosser 60 is an improvement over existing card printers since it allows the printer/embosser to be used for producing credit card type cards.

Referring to figure 2B, once the card is produced 76 it is then given to the applicant and the card delivery process is ended at step 78.

Figure 4 shows an example of a printer/embosser apparatus 80 constructed in accordance with the present invention incorporating those features described above in association with printer/embosser 60 of Figure 3. Apparatus 80 includes a double sided printer/overcoater 82, a magnetic strip encoder 84, an embosser 86 and a tipper 88. Apparatus 80 is provided with an input hopper 90 which is adapted to receive a stack of blank plastic card stock 92 each having a magnetic strip as an integral part thereof. Printer/embosser 80 may also include multiple input hoppers so that a variety of preprinted cards may be available for the system to use. Wherein multiple input hoppers are used there is a method of selecting a card from a particular hopper as required. Input hopper 90 is provided with brushes 91 to clean card 92 as it exits input hopper 90.

In use, card 92 is received by double sided printer/overcoater 82. Printer/overcoater 82 includes a printing station 94 and a flip over station 96. Print station 94 includes two rolls for the thermal transfer foil, one is the feed roll 97 and the other the uptake roll 98. Feed roll 97 contains four alternating colors. Feed roll 97 also includes a clear transfer foil which is used as an overcoater. Each color and clear transfer foil is approximately the width of card 92. Typically the four colors that are used are yellow, magenta, cyan and black so that when combined a full range of

color can be applied. However, the colors that are chosen and the color of card 92 will determine the range of colors that are available to be printed on the card. When the image is applied to one side of card 92 it is passed to flip over station 96 wherein card 92 is flipped over and a blank side is then delivered back to printing station 94. Therefore double sided printer/overcoater 82 prints and overcoats both sides of each card. When the double sided printing/overcoating is completed card 92 is passed through flip over station 96 to hopper 99.

From hopper 99, card 92 is passed to a magnetic strip encoder 84 where the magnetic strip on one side of the card is encoded with the approved information relevant to the particular card holder.

After the magnetic strip encoder 84 the card is passed into an embosser 86 wherein alphanumeric characters are applied to the card 92 so that there are raised numbers and letters on the front of the card. Typically there will be a card number, the user's name and validation dates. Embosser 86 includes an embossing wheel 104, having all of the letters of the alphabet and numbers from 0-9 around the periphery, and a corresponding opposing press disk 106. By positioning card 92 in the appropriate position relative to wheel 104 and press disk 106 all combinations of letters and numbers can be applied. Locator 108 positions card 92 in the appropriate position relative to wheel 104 and disk 106. Locator 108 includes a belt drive system 110 for positioning card 92 in the appropriate horizontal position. Positioning mechanism 112 moves card 92 towards or away from disks 104, 106 so as to position the alphanumeric characters in the appropriate vertical position. The belt drive system 110 moves the card longitudinally along the belts to position the card between wheel 104 and disk 106. Wheel 104 and disk 106 are rotated so that the appropriate letter or number is embossed on the card. The card is moved incremental along the belt drive system 110 until one line of embossing is completed. The horizontal position of card 92 is then changed by positioning mechanism 112 and the next line of printing is executed by moving the card horizontally with

belt drive system 110.

After the embosser 86 the card is passed to a tipper 88, wherein a color is applied to the raised alphanumeric characters. Typically a contrasting color is applied to facilitate reading the embossed characters.

5 When the printing is completed the card is passed to the output hopper station 113.

Printer/embosser apparatus 80 may be expanded to include a chip encoder (not shown). A chip encoder may be added between encoder 84 and printer/overcoater 82 or it may be substituted for magnetic strip encoder 84.

Printer/embosser apparatus 80 is preferably controlled by a computer control system (not shown). The computer control system is attached through input and output ports 114.

15 Some of the components used in the above described printer/embosser apparatus 80 include; an input pusher station #PCPDC-VE, thermal transfer multi color/overcoat sublimation station #PR/DR, and flip over station #PCPDC-WE of the PRESTIGE™ Flat Card Printer made by DigiCard of Austria; and magnetic strip encoder station (Bogen Germany) #CK-1313-24, chip encoder station, embossing wheel station and card tipper station from MAXIMA™ Card Embosser, CIM of Italy. These individual components were constructed to form the integrated system herein for a continuous process to produce individual personalized cards. All components form part of the integrated system. The computer control system was integrated to control all of the components therein.

25 Figure 5 shows the processing steps generally 120 as a card is processed by the printer/embosser apparatus 80. A blank card 92 is obtained from hopper 90 and one side of the card is printed/overcoated 122. The card is flipped over 124 and then the other side is printed/overcoated 126. The electronic storage device, a magnetic strip and/or a chip is encoded 128. The card is embossed 130, then tipped 132 and the finished individual personalized card is output 134.

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Computer control system controls the processing steps shown generally in figure 5 including the printer/overcoater 82, magnetic strip and/or chip encoder 84, the embosser 86 and the tipper 88. Computer control system is also operably connected to the image capture system. In addition typically the computer control system is operably connected to a central or host database for the issuing institution. This host database provides the information that is encoded onto the electronic memory device. The issuing institution will have a secured system and the appropriate security measures will have to be conducted to access that information. The issuing institution will keep a record of the encoded information and the photographic image of the card user.

The main steps of the preferred operating procedure of the computer control system is shown generally at 140 in figure 6. The computer control system is started up at step 142 and a predetermined log in procedure is followed. The appropriate password or other security procedure is then executed. The card design is selected, created or modified at step 144. A picture of the card holder is taken 146 with the image capture system. The image capture system automatically captures the picture in a digital format. This may be done directly through an integrated camera/computer system or indirectly through a camera that is operably connected to a computer or with a picture that is scanned into a computer. The picture is transferred to the computer control system 148. The operator inputs the cardholder information 150. This may be done by inputting all of the information manually or by inputting distinctive information and obtaining a file that is already exists in the institutions data base. An electronic handshake 152 takes place between the computer control system and the host database. Typically to facilitate this electronic handshake hardware/software system such as Ethernet™, Token Ring™, FDDI™, Serial™, ATM™, 5250™, Arcnet™, or PC3278™. The particular system that is used will be dependent on the host system. Once the handshake 152 is completed the host system provides information such as a Customer

Verification Value (CVV) to the computer control system 154. All the information is sent to the printer/embosser apparatus 156 and the card is produced 158. A log is produced 160 for both the host system and the computer control system. Typically the CVV will not be retained by the computer control system and that value will only be held by the host system. The logs are used to audit the system at the host level and the individual system level. The photograph image may be stored in any or all of the image capture system, the computer control system and the host system as determined by the users. In addition a customer profile is stored 162 in the host system and the computer control system. The procedure is then concluded 164 and the system is ready to be used again and the procedure may be configured so that the system continues at the select card design step 144 or the security procedure as designed by the user.

It will be appreciated by those skilled in the art that the personalized individual secured card production apparatus having the features that are described above will allow the operator a wide range of flexibility. For example one machine could be used to produce a wide variety of cards including a bank card, a health card, a drivers licence, specialty cards and the like. This is an advantage to a organization which issues cards, for example a financial institution, which could then obtain the rights to produce and distribute cards for other organizations such as the health cards. In addition, the cards could be easily modified so when an institution is instituting a new marketing strategy the card design can be readily changed to enhance this new strategy. This is not currently available since the batch system is slow to change the graphics. Further, it is common that certain financial institutions sponsor designated organizations such as air miles programs, arts organizations, university alumni associations or car manufacturers and the card associated with each organization could have a specific design. Personalized individual secured card production apparatus would allow one branch to accommodate these different organizations and produce the particular card. The ability to easily, quickly and efficiently

change from one type of card to another is not available with the batch system which produces a batch of the same cards with each run.

Personalized individual secured card production apparatus and system as disclosed herein could also be used to print on only one side of the card. For example, it could be used to add a picture of a cardholder to a preprinted card with a blank portion wherein the cardholder picture is to be applied. Wherein the card production apparatus is used for such an application the printer/embosser would only be required to print on one side of the card. The remainder of the apparatus could be used as described above. That is, the electronic memory device would be encoded, the card would be embossed and the embossed card would be tipped.

It will be appreciated that the above description related to one embodiment by way of example only. Many variations on the invention will be obvious to those skilled in the art and such obvious variations are within the scope of the invention as described herein whether or not expressly described.

WHAT IS CLAIMED AS THE INVENTION IS:

1. A personalized individual continuous card production system for producing secured cards at a predetermined site for an applicant that meets the predetermined minimum criteria for receiving an approved secure card wherein the personalized individual secured card is delivered to the applicant at the predetermined site, the system comprising:
- 5 a printing/embossing means comprising a printing mechanism, an overcoater, an encoder and an embosser for printing and embossing the approved secured card for an applicant in a continuous process; and
- 10 a computer control system operably connected to the printing means for operating and controlling the printing/embossing means.
2. A continuous card production system according to claim 1 wherein the printing mechanism is a double sided printer.
3. A continuous card production system according to claim 2 wherein the
- 15 encoder is a magnetic strip encoder.
4. A continuous card production system according to claim 2 wherein the encoder is a memory chip encoder.
5. A continuous card production system according to claim 3 wherein the encoder further includes a memory chip encoder.
- 20 6. A continuous card production system according to claim 2 further comprising a camera and an image capture system operable connected to the computer and wherein the image capture system translates the image from the camera into a digital format.
7. A continuous card production system according to claim 3 further

comprising a camera and an image capture system operable connected to the computer and wherein the image capture system translates the image from the camera into a digital format.

5 8. A continuous card production system according to claim 4 further comprising a camera and an image capture system operable connected to the computer and wherein the image capture system translates the image from the camera into a digital format.

9. A continuous card production system according to claim 1 wherein the printing mechanism and the overcoater are the same mechanism.

10 10. A continuous card production system according to claim 2 wherein the printing mechanism and the overcoater are the same mechanism.

11. A personalized individual secured card printing/embossing apparatus for manufacturing individual secured cards in a continuous process from a card having a memory device therein, the printing/embossing apparatus
15 comprising:

a printing mechanism for printing a design onto the card to produce a printed card;

an overcoater operably connected to the double sided printing mechanism for overcoating the design on the printed card with a foil;

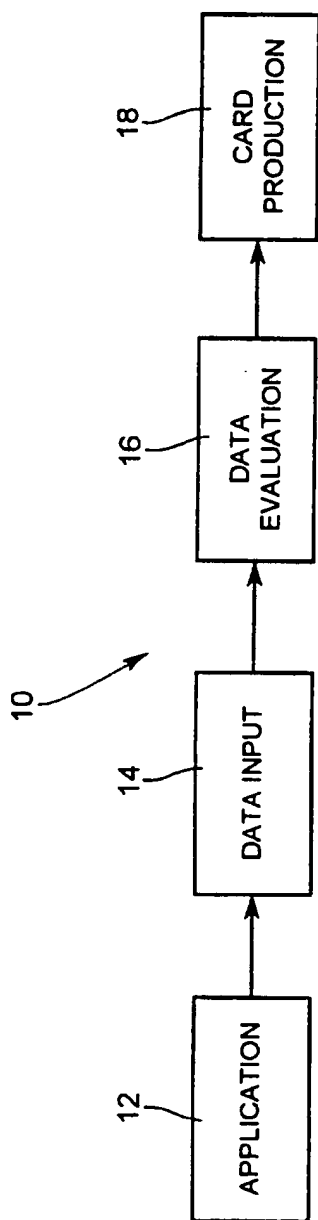
20 an encoder operably connected to the overcoater for encoding predetermined information into the memory device of the card; and

an embosser operably connected to the encoder for producing raised alpha numeric characters on the card.

12. A printing/embossing apparatus according to claim 11 wherein the
25 printing mechanism is a double sided printer.

13. A printing/embossing apparatus according to claim 12 further including a tipper operably connected to the embosser for applying color to the raised alphanumeric characters on the secured card.
- 5 14. A printing/embossing apparatus according to claim 13 wherein the printing mechanism and the overcoater are the same mechanism.
15. A printing/embossing apparatus according to claim 14 wherein the memory device is a magnetic strip and the encoder is a magnetic strip encoder.
- 10 16. A printing/embossing apparatus according to claim 14 wherein the memory device is a memory chip and the encoder is a memory chip encoder.
17. A printing/embossing apparatus according to claim 15 wherein the memory device also includes a memory chip and the encoder further includes a memory chip encoder.

1/7

FIG. 1

SUBSTITUTE SHEET (RULE 26)

2/7

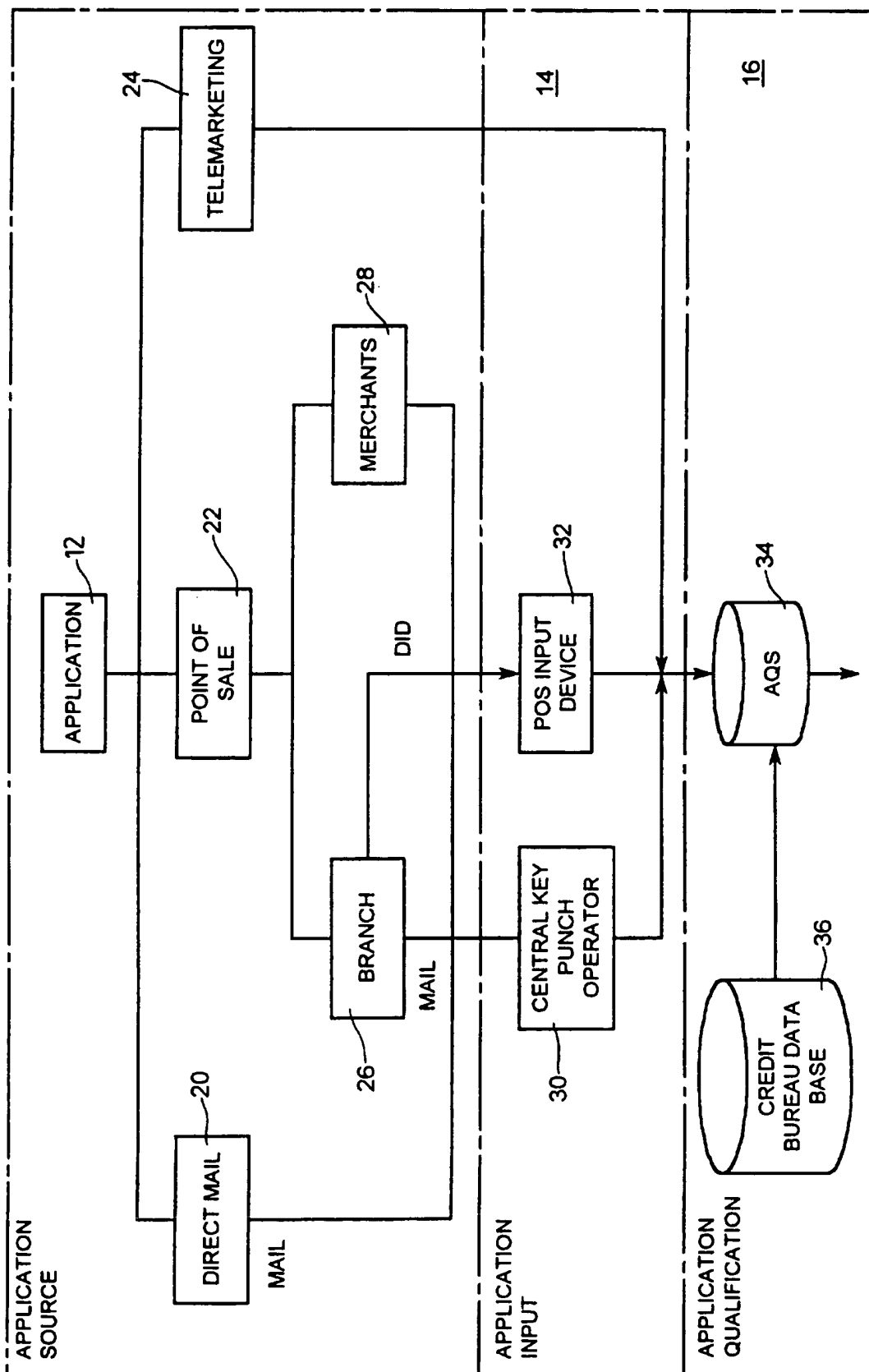


FIG. 2A

SUBSTITUTE SHEET (RULE 26)

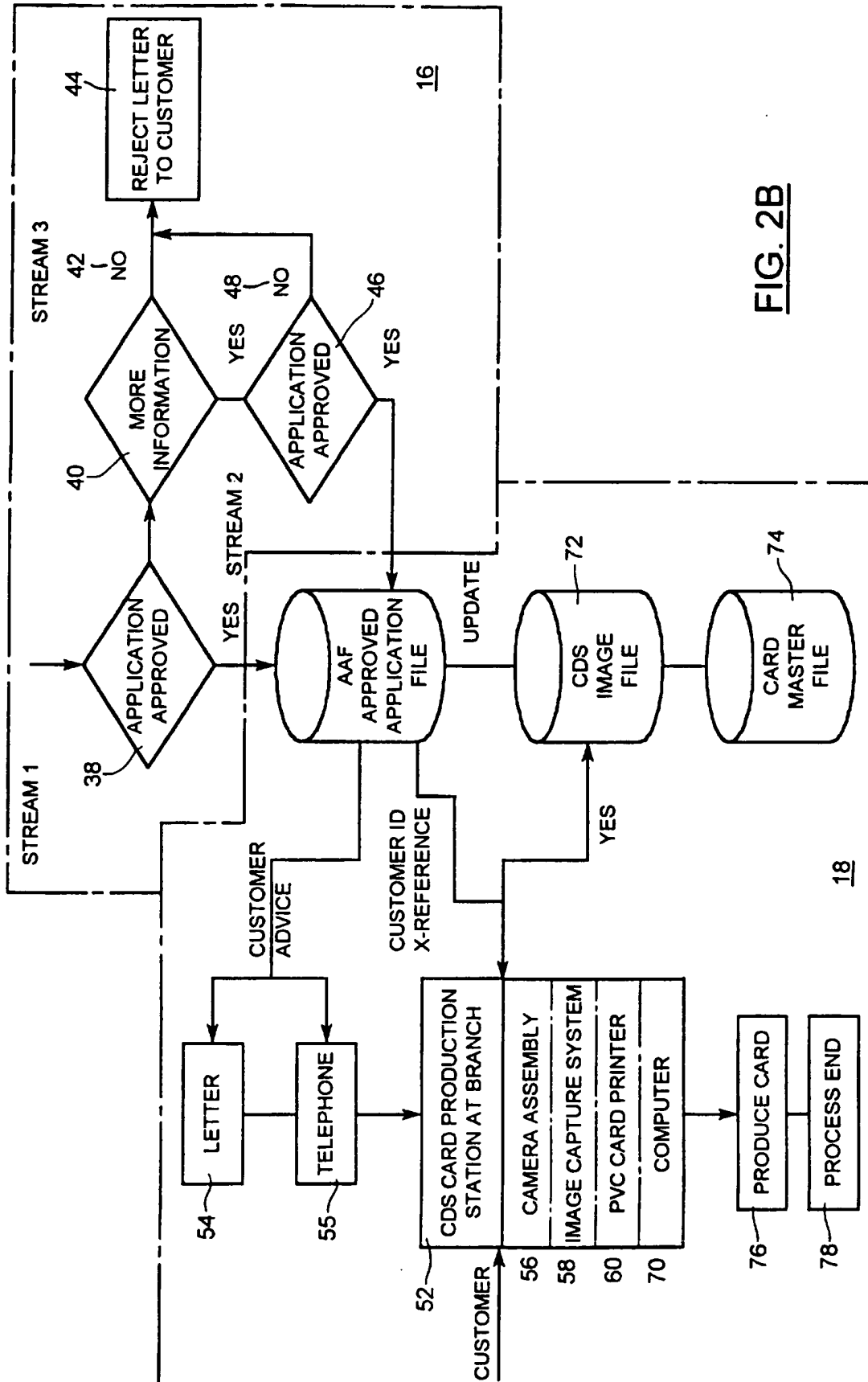
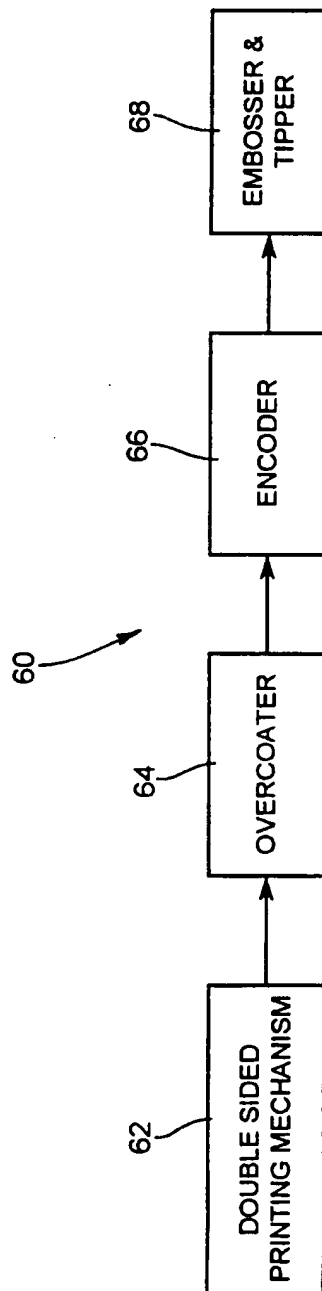


FIG. 2B

4/7

FIG. 3

SUBSTITUTE SHEET (RULE 26)

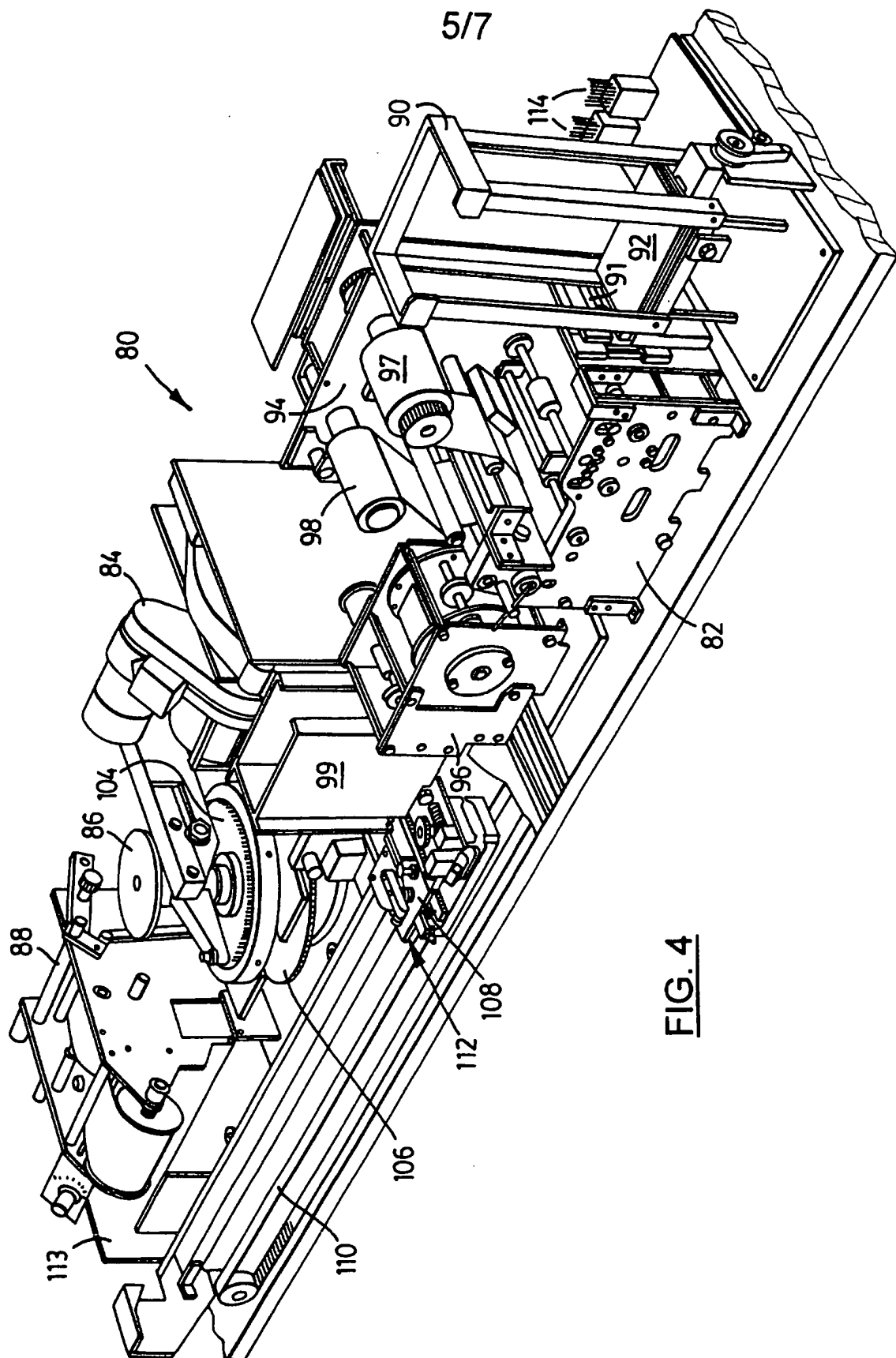
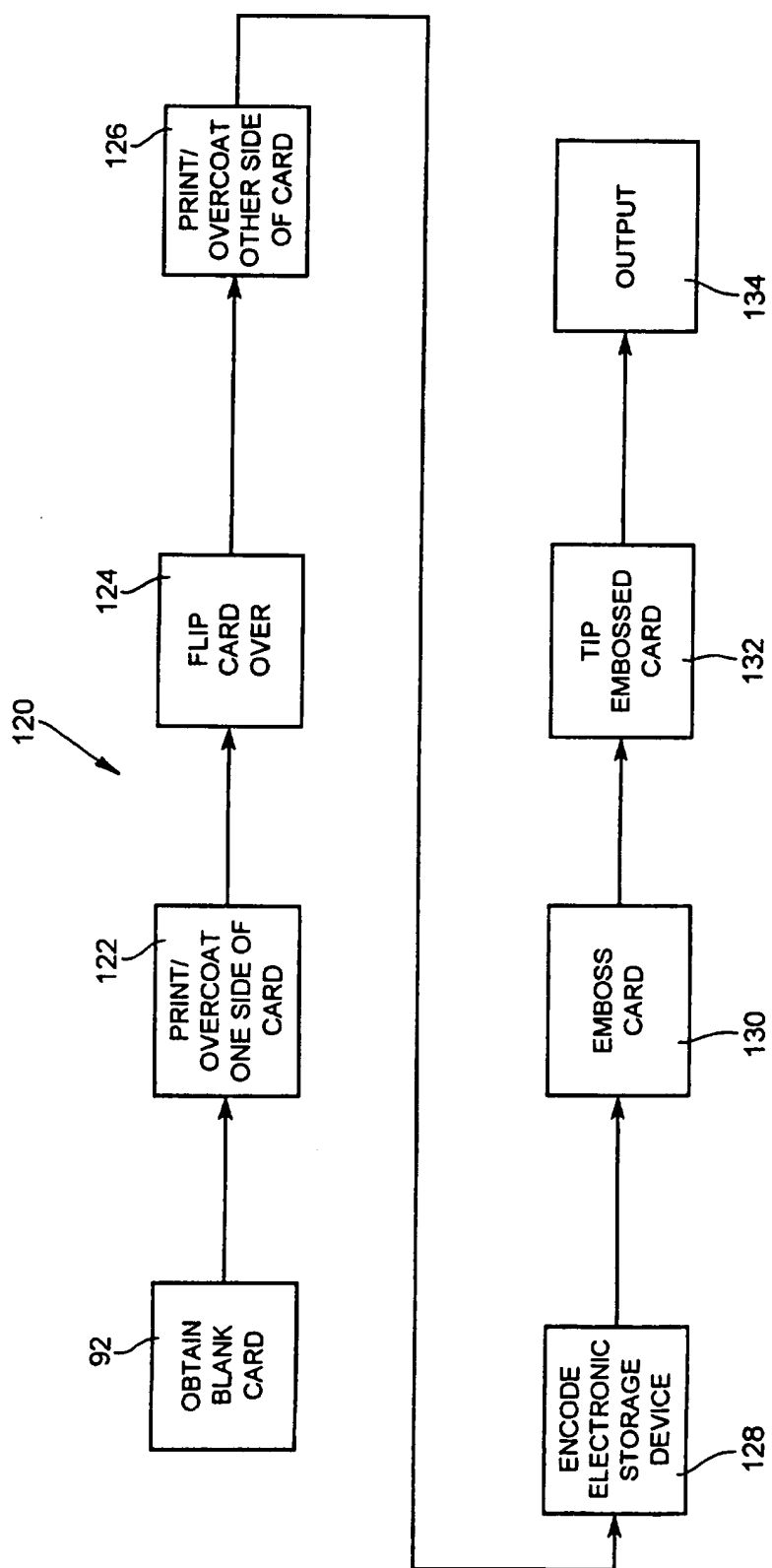


FIG. 4

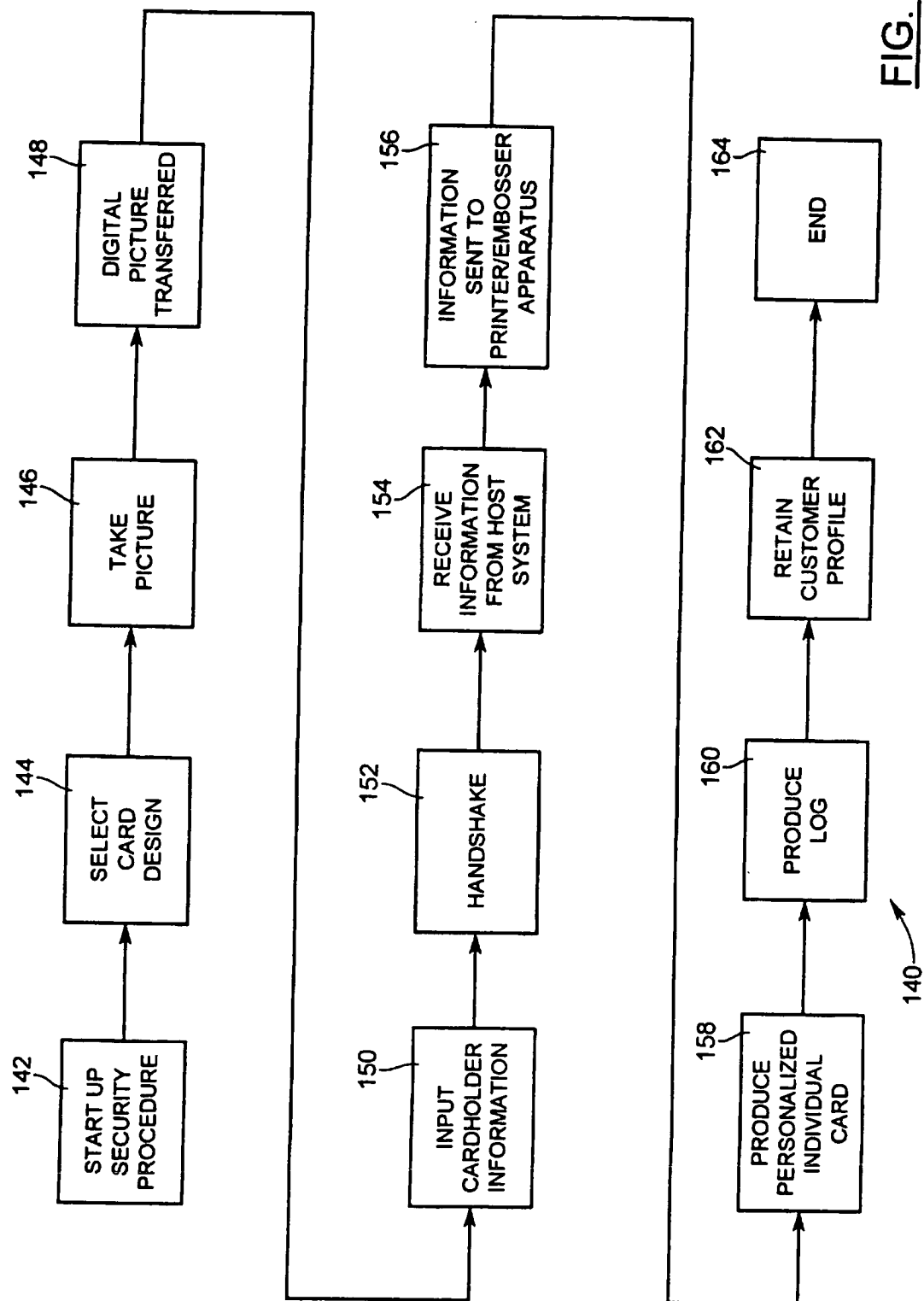
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6/7

FIG. 5

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7/7



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/CA 95/00725

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B42D15/10 B29C59/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B42D B29C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	W0,A,93 04433 (DATACARD CORPORATION) 4 March 1993 see the whole document -----	1-17

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Date of the actual completion of the international search

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Evans, A

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 95/00725

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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